Short communications

Is the water-crossing tendency of adult European Honey Buzzards influenced by a time minimization strategy during spring migration?

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The European Honey Buzzard, *Pernis apivorus*, is a completely migrant species wintering in central West Africa and breeding in the Palearctic region (Ferguson-Lees & Christie, 2001). Compared with other raptors, it has an intermediate morphology between smaller species, such as falcons and harriers largely using powered flight, and heavier soaring raptors, such as buzzards, eagles and vultures (Kerlinger, 1989; Pennycuick, 2008; Panuccio *et al*., 2013b). European Honey Buzzards mostly use soaring and gliding flight over land during migration, concentrating at bottlenecks such as the Strait of Gibraltar and Bosphorus like broad winged raptors (Zalles & Bildstein, 2000). However, counts at several European bottlenecks suggest different spatial migration patterns of this species in autumn and spring. In particular, at the Strait of Gibraltar up to 17042 individuals were counted per season during spring 2008 and 2009 from six watch points used at the same time. On the other hand in autumn 2008 more than 70000 European Honey Buzzards (about four times the number recorded during spring) were counted from three watch points, 63192 from a single point, peaking in the third ten-days of August (De La Cruz *et al*., 2011; Programa Migres, 2009). Conversely, in the Central Mediterranean region the migratory flow of this species is less conspicuous during autumn movements, although occurring on a narrower front such as at the Strait of Gibraltar in the same season. Each spring at least 25000-30000 individuals reach Europe crossing the Mediterranean between Tunisia and western Sicily. On the other hand, the autumn migration of adult European Honey Buzzards through the Central Mediterranean area involves on average 15000 individuals each season (Agostini & Panuccio, 2005; Morabito *et al*., 2013; Agostini *et al.,* unp. data). These differences in counts at these two bottlenecks clearly show a stronger tendency of adult European Honey Buzzards to undertake longer sea crossings during northbound rather than during southbound movements.

During their first (southward) migration, juvenile European Honey Buzzards generally migrate later than adults (Agostini *et al*,. 1999), and thus cannot learn the shorter crossings of the Mediterranean (via the Strait of Gibraltar and the Bosphorus) by following experienced individuals. As a result, they mostly migrate on a broad front over water, like falcons and harriers (Meyer *et al*., 2000; Panuccio & Agostini, 2010; Panuccio *et al*., 2013b), along an innate NE-SW axis (Agostini & Logozzo, 1995; Agostini *et al*., 2002; Agostini, 2004; Agostini *et al.,* 2004; Schmid, 2000; Hake *et al.,* 2003). On the base of this age-dependent migration strategy, some authors have suggested that long water crossings through the Mediterranean are performed by less experienced individuals during both spring and autumn (Schmid, 2000; Hake *et al.,* 2003). This hypothesis would implies that birds will eventually learn the more favorable, though longer, routes via Gibraltar and Bosphorus. However, during visual observations in spring at the Strait of Messina (between the 'toe' of southern continental Italy and Sicily, Fig. 1), only a minority of birds with immature characteristics was reported (note that most juveniles remain in Africa until their second spring, Ferguson-Lees and Christie 2001) and, as expected, younger birds migrated later in the season, mostly during the last ten days of May (Panuccio & Agostini, 2006).

In spring, after reaching Sicily from Tunisia, northbound European Honey Buzzards make further decisions, with alternative flyways over water en route to mainland Italy and the Balkans; they are not all funneled towards the Strait of Messina, the shortest sea crossing between Sicily and Italy, but thousands of individuals fly across the Tyrrhenian Sea (Panuccio *et al.,* 2004; Agostini *et al.,* 2005; 2007; Fig. 2). To explain these results, Agostini & Panuccio (2005) suggested that, during spring migration, adult European Honey Buzzards tend to cross the Mediterranean on a broader front using more direct paths between wintering and breeding range since spring birds may be more strongly motivated to reach their destination as quickly as possible as a result of a time minimization strategy (Nilsson *et al.,* 2013). Also in the eastern Mediterranean, observations on the migration of this species seem to confirm a

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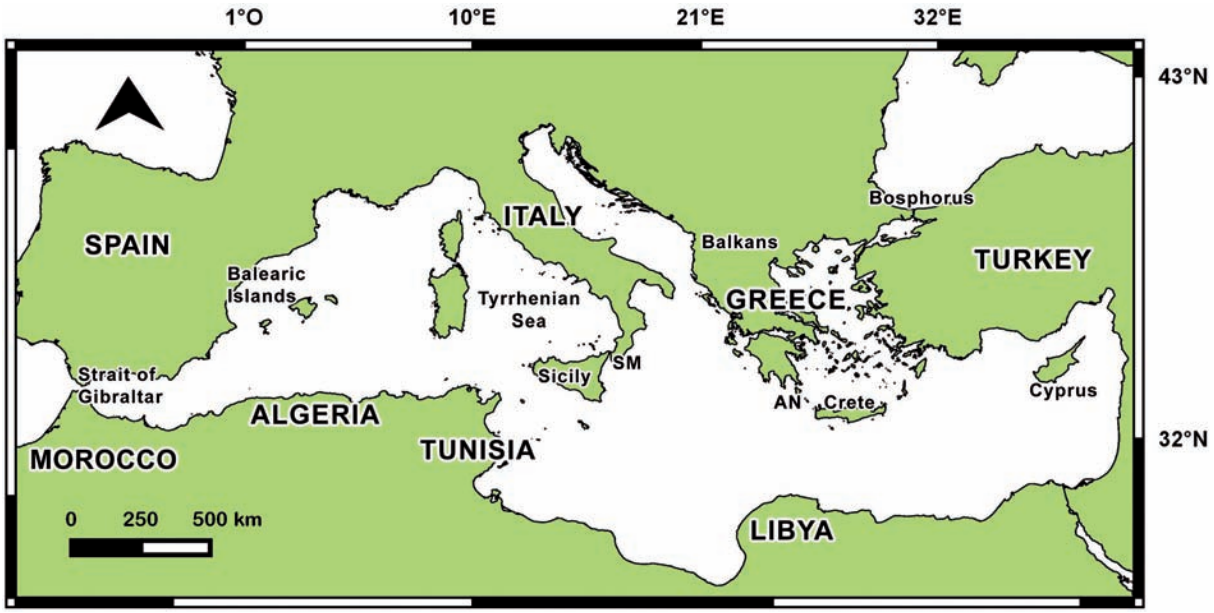

Fig. 1 - The Mediterranean Sea (SM = Strait of Messina; AN = Antikythira).

Fig. 2 - An adult male European Honey Buzzard during the crossing of the Tyrrhenian Sea along the Central Mediterranean flyway. May 2011. (Photo by Michele Panuccio).

stronger tendency to cross larger stretches of sea in spring rather than in autumn. In particular hundreds of individuals concentrate each autumn over the island of Antikythira en route to Crete and Africa, while during spring European Honey Buzzards are expected to bypass the island probably choosing a more direct route between Libya and Greece (Agostini *et al.,* 2012; Panuccio *et al.,* 2013a; Fig. 1).

In recent studies, some authors (Meyburg *et al.*, 2010; 2013; Vansteelant *et al*., 2014) plotted movements of European Honey Buzzards fitted with GPS loggers and satellite transmitters. One bird, an adult male breeding in northern Germany and wintering in Nigeria, was tracked for three consecutive spring migrations in 2004-06. In 2004 it crossed the Mediterranean at the Strait of Gibraltar, but in 2005 and 2006 it made longer sea crossings from Algeria to northern Spain via Balearic Islands (Meyburg *et al*., 2010; Fig. 1). Another bird showed loop migration at a larger scale, undertaking the crossing of the central

Mediterranean during spring movements (Meyburg *et al*., 2013). In addition, Vansteelant *et al*. (2014) showed that European Honey Buzzards migrate faster during spring rather than autumn. These results do not match the hypothesis of Schmid (2000) and Hake *et al.* (2003) but suggest that experienced birds can choose more direct flyways between wintering and breeding areas during spring movements, undertaking longer sea crossings probably as a result of a time minimization strategy. In this scenario, the discovery of more direct paths between breeding and wintering areas made by juvenile birds during their first migration (Hake *et al.*, 2003) may have adaptive value (Agostini & Panuccio, 2005).

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Short communications

Piracy strikes back on Lake Maggiore (Northern Italy): first report of Common Merganser *Mergus merganser* kleptoparasitizing Great Crested Grebe *Podiceps cristatus*

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Kleptoparasitism refers to the stealing of already procured food (Brockmann & Barnard, 1979). Although it is not specific to birds (Iyengar, 2008), 'piracy', as it is also called, has especially been studied in this group, where it has been associated with a relatively large brain, habitat openness and presence of vertebrate prey in the diet (Morand-Ferron *et al*., 2007). This behaviour appears more common in some waterbird families.

Fish-eating waterbirds, such as the Great Crested Grebe (*Podiceps cristatus*) and the Common Merganser (*Mergus merganser*) occupy ecological niches matching at least two of the three factors apparently promoting kleptoparasitism (open habitat and vertebrate food). Unsurprisingly, piracy has been recorded in both species (Källander, 2006; 2013). For instance, Källander (2013) reported intraspecific kleptoparasitism at low frequency (0.14 attempts per hour and individual) and with low chances of success (<20% of attempts) in flock-fishing Great Crested Grebes, and suggested (2006) that the behaviour might be even more frequent among mergansers. Often piracy occurs among members of different species (Brockmann & Barnard, 1979, and references therein), as when Great Crested Grebes or Common Mergansers are mobbed by gulls trying to steal their prey (Källander, 2006). However, despite reports of both intra- and interspecific kleptoparasitism in these well-studied species, no published observations of piracy by Common Mergansers on Great Crested Grebes were found. In this short note, the first account of such behaviour is provided.

The occasional observation by AC was made by eye from the lake shore at ca. 18.30, local time, on 18 April 2014, near the village of Belgirate (Lake Maggiore, Italy; 45.83"N, 8.57"E). Pictures documenting the event immediately before and after it took place were taken using a Panasonic DMC-TZ6 Lumix digital camera with a Leica lens and a 12× optical zoom.

An isolated Great Crested Grebe, swimming in approximately 25-50 m distance from the shore, was seen while it was trying to swallow a large fish (Fig. 1a), later identified from the picture (Luigi Sala, pers. comm.) as a European Perch (*Perca fluviatilis*). The bird was handling the fish with some difficulty because of its size (Fig. 1b,c). A solitary female Common Merganser was swimming next to the shore about 100 m from the grebe. Approximately one minute after the first observation of the grebe, the bird, still holding the fish, fled swimming fast, while the merganser came 'flight-rushing' towards it. As the merganser approached, the grebe dived, immediately followed by the merganser. They both surfaced again soon, ca. 10 m farther from where they had dived. The Great Crested Grebe had lost its prey and the Common Merganser swam away holding the perch in her beak (Fig. 1d). The grebe followed her for a few seconds but soon gave up the chase. Shortly afterwards the merganser swallowed the fish.

The Great Crested Grebe population of Lake Maggiore is large and it may reach a few thousand individuals when wintering birds from northern Europe join local residents (Gagliardi *et al*., 2007). The Alps are also home to a smaller resident population of Common Merganser (ca. 1000-1400 pairs in 1998; Keller, 2009), which is augmented in winter with birds from northern Europe.

The occurrence of breeding individuals of Common Merganser on Lake Maggiore is relatively recent. The first reports of females with ducklings are from 1998 for the north-western side of the lake, and from 2003 for the

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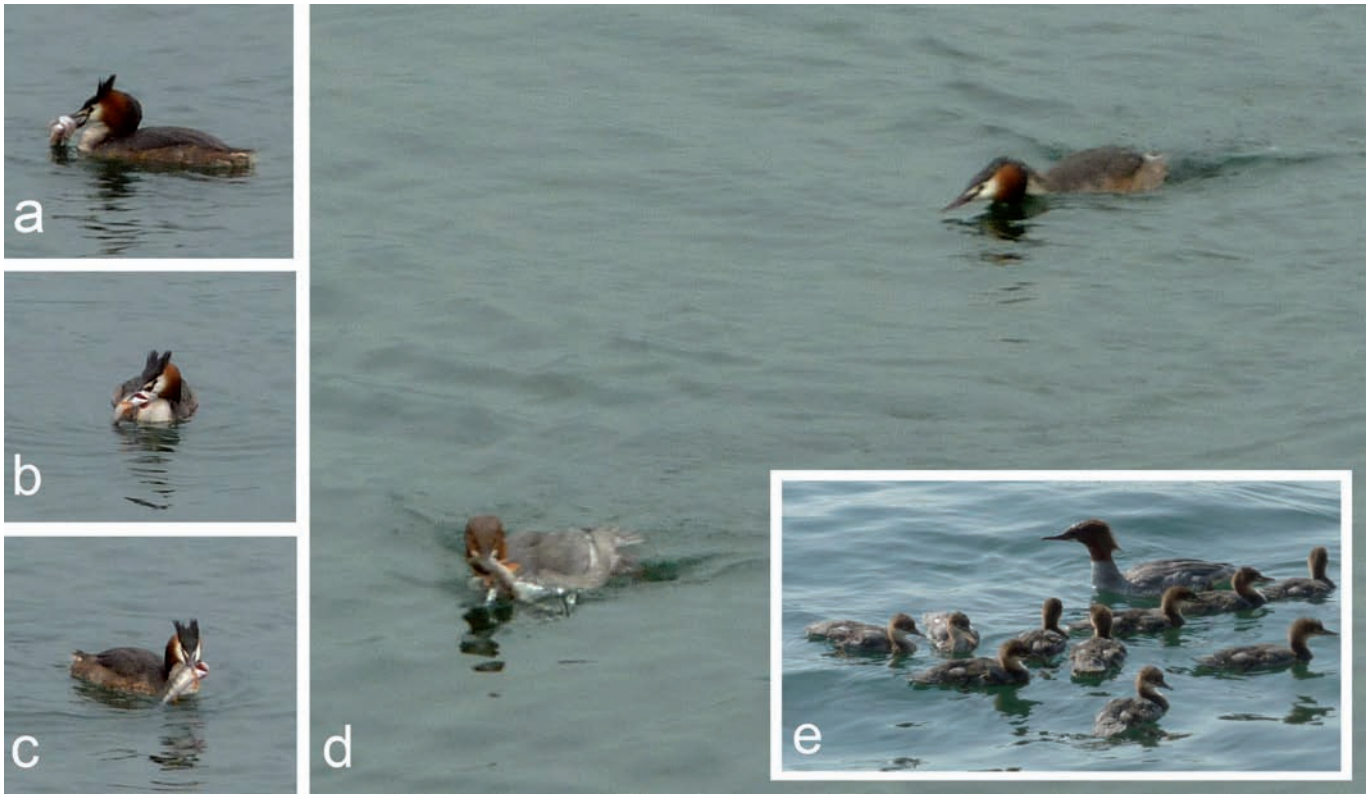

Fig. 1 - a-c) Great Crested Grebe trying to swallow a European Perch. d) Female Common Merganser, after chasing the grebe underwater, manages to steal the perch and swims away. e) Female Common Merganser with 10 ducklings photographed in 2011 by AC in the same locality.

north-east (Gagliardi *et al.,* 2007, and references therein). A recent ornithological report for Piedmont and the Aosta Valley (Alessandria *et al.,* 2013) and personal observations by AC (Fig. 1e) confirm the now relatively common presence of breeding Common Mergansers on the lake. As for the Great Crested Grebe, its population also seems to be increasing and the two species might compete for fish with each other, as well as with Great Cormorants (*Phalacrocorax carbo*), which also permanently inhabit the lake. Detailed studies of population trends and competitive interactions among waterbirds on Lake Maggiore are, however, missing.

Observations of kleptoparasitic behaviour, in which Great Crested Grebes are attacked by other birds (*e.g.*, gulls; see Källander, 2006) are relatively rare, as this species mostly captures small fish which is immediately swallowed. Källander (2013) reported instances of intraspecific kleptoparasitism in Great Crested Grebes fishing in flocks, a behaviour that in itself is relatively uncommon (Källander, 2008). In all instances, piracy happened if a bird had captured a large fish which could not be swallowed in one gulp. This is consistent with the suggestion that kleptoparasitism occurs if these waterbirds capture unusually large preys. On Lake Maggiore, the open habitat gives the grebes no place to hide while the time required for ingesting larger prey creates a chance for nearby birds to try stealing the fish, as it was the case in this observation.

Interestingly, despite the rarity of piracy against grebes, the Great Crested Grebe's immediate fleeing response to the still distant 'flight-rushing' merganser raises the issue of whether the bird had previous experience of similar attacks. The coexistence of the two species on Lake Maggiore is, as mentioned, relatively recent and the rapid response of the grebe could actually be instinctive rather than learnt. Our occasional observation, however, cannot provide an answer to this question.

Both species are mainly piscivorous. However, the Common Merganser might be more opportunistic than the Great Crested Grebe in terms of diet, as it was seen being fed with bread by tourists in the same area (AC, pers. obs.). Great Crested Grebes, on the other hand, seem to be more strict in their food preferences but could have expanded their niche by fishing at night (AC, pers. obs.), a behaviour repeatedly observed in Belgirate, where grebes may be exploiting fish preys attracted by the light of nearby street-lights. That Great Crested Grebes can finely tune their activity to optimize feeding efficiency has been suggested by Piersma et al. (1988, p. 481), who showed that grebes in their study population tend to fish "during twilight when much of their prey is near the surface, where light intensities allow the fish to be detected and captured".

Future studies are required for an accurate assessment of the behavioural ecology and interactions between these waterbirds and their potential effects on the population

dynamics in Lake Maggiore and other sub-alpine lakes. For the time being, we must limit ourselves to report the first observation worldwide of merganser-grebe kleptoparasitism, which is in the title jokingly referred to piracy striking back on Lake Maggiore, once home to the legendary 15th century Mazzarditi 'pirates'.

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